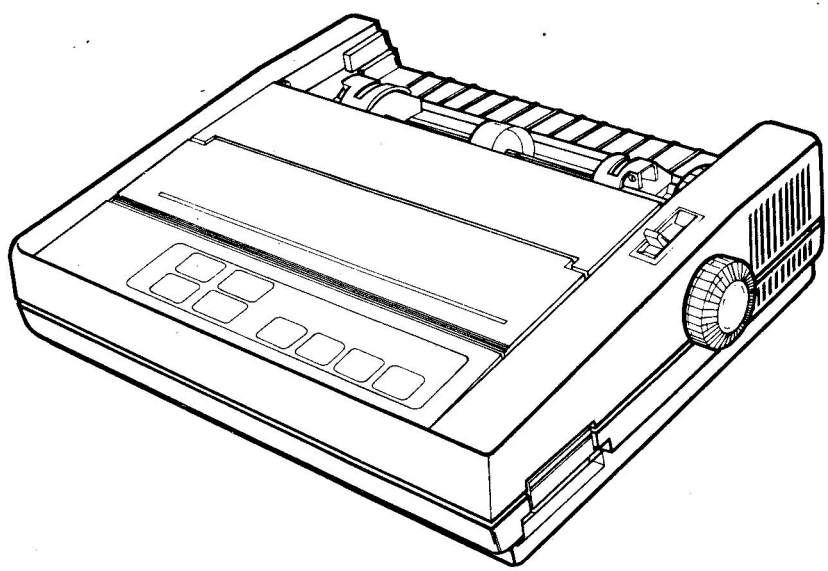
SAMSUNG

USER'S HAND BOOK

SP-2412

DOT MATRIX PRINTER



FCC COMPLIANCE STATEMENT FOR USERS

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

WARNING:
Changes or modification to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE:
This equipment has been tested and found to comply with the limits for a class B digital device; pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. the user is encouraged to try to correct the interference by one or more of the following measures;

- reorient or relocate the receiving antenna
- increase the separation between the equipment and receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- consult the dealer or an experienced radio/TV technician for help

Important Safety Instructions

Provided by Underwriters Laboratories Inc.

1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
6. Slots and openings on the cabinet and the back or bottom are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, do not block or cover these openings. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated from the type of power source indicated on the marking level. If you are not sure of the type of power available, consult your dealer or local power company.
8. This product is equipped with 3-wire grounding -type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding- type plug.
9. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be walked on.
10. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
12. Except as explained elsewhere in this manual, don't attempt to service this product yourself. Opening or removing those covers that are marked "Do not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing on those compartments to service personnel.
13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    A. When the power cord or plug is damaged or frayed.
    B. If liquid has been spilled into the product.
    C. If the product has been exposed to rain or water.
    D. If the product does not operate normally when the operating conditions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
    E. If the product has been dropped or the cabinet has been damaged.
    F. If the product exhibits a distinct change in performance, indicating a need for service.

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Chapter 1

INTRODUCTION

1.1 Product Overview

Now you have a fast, reliable and state-of-the-art dot matrix printer. Its all features will meet wide variety of your needs. This printer has features of other top-quality printers, and some additional ones as well.

Front Panel Selection

You can change the print quality (Draft, NLQ) and pitch (10, 12, 15, 17, 20 CPI and PS) from front panel keypad. You can instantly see your current status by the related LEDs. You can feel the easy-of-use features.

Full IBM & Epson Emulation

This printer fully emulates IBM Proprinter X24E & Epson LQ-850 control codes. It acts like an Epson LQ printer or IBM Proprinter. That means this will support almost all the state-of-the-art softwares. With this printer, you can easily print hardcopies of any wordprocessing softwares, spreadsheets and other commercial application programs, as well as your own programs.

Life Style Design

If outlook and design is "the name of the game", this will beat all other printers. Its "Life Style Design" means that it adapts to any working environments, office, laboratory, or home! It demonstrates good design wherever it sits.

Push/Pull Tractors & Paper Park

Owing to this printer's push/pull tractors, you can enjoy various paper feeding paths, top, bottom and rear. It also has a PAPER-PARK function. As you know, when you use a single sheet, tractor should not operate. Paper-

park function will do this by sliding off the gear train out of the tractor. It makes tractors do not operate during single sheet feeding. With this functionality, you can switch freely between roll papers and single sheets with just one lever operation.

Micro Feeding

The printer has a "Micro Feeding" capability. With FORM FEED and LINE FEED buttons in ON LINE, you can advance the paper forward and backward a little amount. So you don't have to feed the paper manually at all.

Input Buffer

The printer's standard input buffer is 8K bytes, and it will be sufficient for almost any personal use. But if you want a big print buffer to let your computer be free from the hassle of printing job, you can install an optional 32K bytes buffer, making a total of 40K bytes. If you select Down LD Enable in initial setting mode, printer input buffer is 24K bytes(16K for Download).

Interface

This printer has a standard Centronics interface, and an optional RS-232C interface that can be connected to almost any computer. In order to use RS-232C, install the serial interface board after removing the dummy-cover on the bottom-cabinet. For purchase installment of the serial interface board contact your dealer.

Enhancements

This printer has lots of enhancements such as expanded, compressed, emphasized, vertical expand, double strike, italics, superscripts, and subscripts.

Mode Preference Settings Through NVRAM

With the aid of Non-Volatile RAM memory, you can permanently store your preferred printing modes e.g. code page, form length, etc. The mode setting procedures are so easily designed that anyone can choose personal preferences.

1.2 Specifications

- Printing Type
  Serial Impact Dot Matrix (24 PIN)

- Printing Speed

Draft	200 CPS (Characters per second)
LQ(Letter Quality)	67 CPS (Characters per second)

- Maximum Printing Width

80 CPL(Character per line)	10 CPI
Dot Image	2880 dot/line

- Print Direction

Bi-directional	logic seeking in text mode
Uni/Bi-directional	logic seeking in bit image graphic mode

- Character Styles
  Standard ROM Font
  Italics
  14 International Character Sets
  Downloadable Font(in case of installing an optional 32K bytes buffer)
  Super/Subscripts
  Double Strike
  Emphasized(Bold)
  Proportional
  Underscore/Overscore
  Double Wide
  Double High

- Font Styles

Draft	200 CPS
Roman	67 CPS
Sans Serif	67 CPS
Courier	67 CPS
Letter Gothic	67 CPS
Prestige Elite	67 CPS

- Character Set
  SET 1, SET 2, SET 3(Italics), All Character Sets

- Code Page
  #437, #850, #860, #861, #863, #865

- Printing Modes
  Fixed Pitch Mode
  Proportional Pitch Mode

- Line Spacing
  1/6" Default
  1/8", n/60", n/72, n/180", n/216", n/360"

- Paper Handling
  Built in Push/Pull Tractors
  Paper-Parking
  Friction Feed
  Bottom Feed
  Auto Single Sheet Load
  Paper Out Detector
  Tractor Mode Detector

- Paper

Length	6, 8, 11, 11 2/3, 12, 14, 15 inch
Width	4~8 inch
Copy	Original + 3 Copies(.33 mm max))

- Ink Ribbon
  Harmonica type

- Emulations
  IBM Proprinter X24E
  Epson LQ-850

- **Interface**
  Centronics Parallel (Standard)
  RS-232C Serial (Optional)

- **Input Buffer**
  8K Bytes Standard, expandable to 40K Bytes

- Power Requirements

North America	120Vac ± 10%, 60Hz ± 2Hz
Europe	220/240Vac ± 10%, 50Hz

- Power Consumption

Operating	1.25 Amps 120VA
Standby	0.6Amps 120VA

- Noise

Quiet mode	up to 55 dB
Normal mode	up to 60 dB

- Dimension
  400 (W) × 360 (D) × 113 (H) mm

- Weight
  approx. 8Kg less

- Reliability

MTBF	4,000 Hours excluding Printhead (25% Duty Cycle & 30% Print Density)
Printer Head Life	200 million strokes per wire

Chapter 2

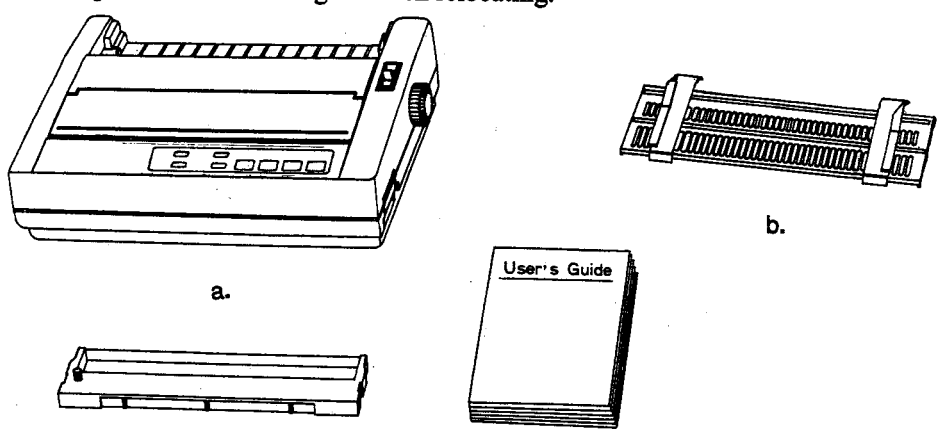
SETTING UP THE PRINTER

2.1 Unpacking the Printer

2.1.1 Checking the Parts

Carefully take all the parts out from the box. Make sure you have all the parts shown in Fig. 2-1 and none of them are damaged during transportation. If there is any defect or missing parts, contact the dealer or the distributor where you bought the printer.

Do not throw away the box or any of the materials used for protection of the printer. Use them again when relocating.



a.

b.

c.

d.

a. printer
b. paper guide
c. ribbon cassette
d. user's guide

Fig. 2-1 Printer Parts

The names of the printer parts are shown in figure 2-2. They will be frequently referred to in later chapters.

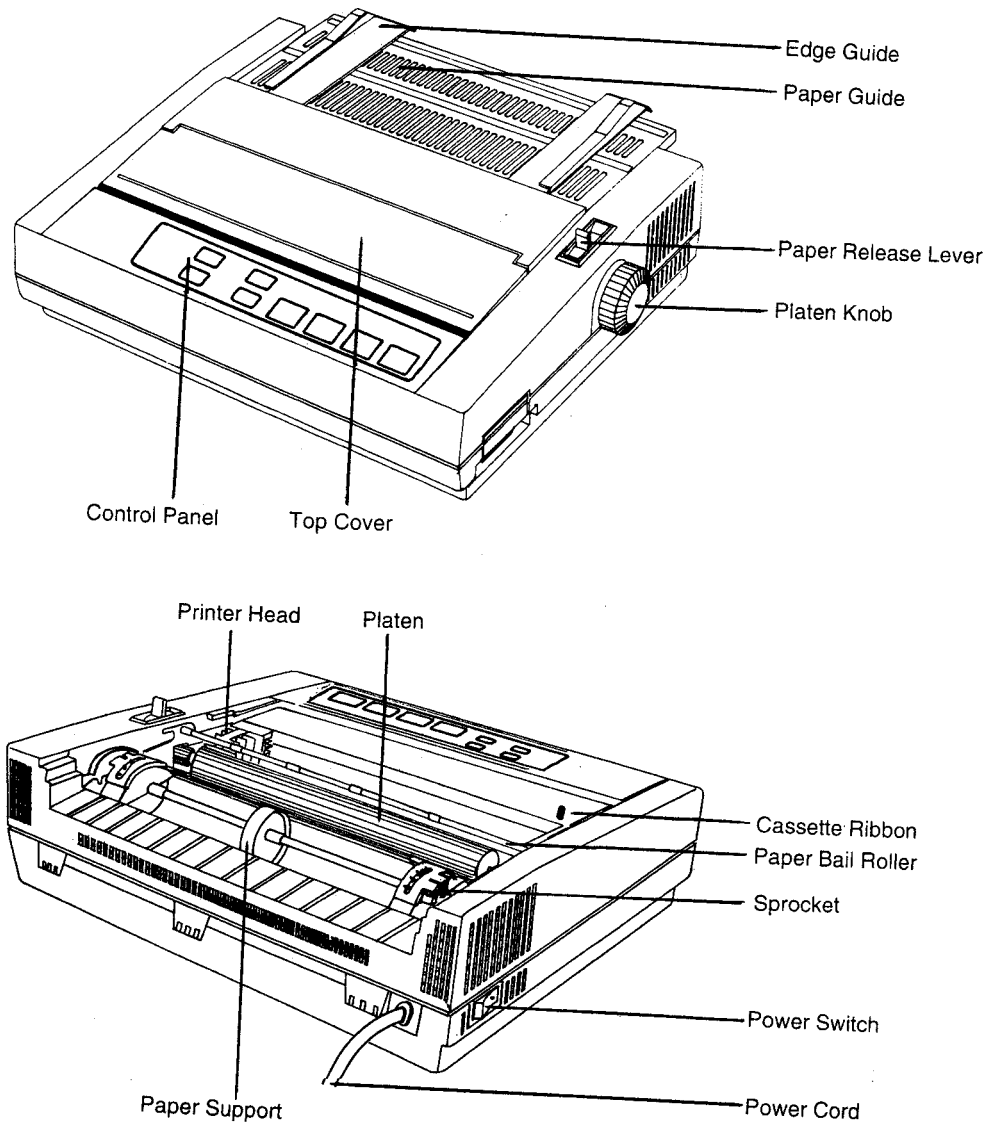


Fig. 2-2 Names of the Printer Parts

2.1.2 Removing the Protective Materials

There are a couple of protective materials inside the printer to prevent the damage during transportation. These protective materials must be removed before use.

Make sure all protective materials are removed. Turning the printer on with these materials can cause irreparable damage to your printer.

To remove the protective materials, follow the instructions listed below:

1. Remove the tape "A" on the back cover, the tape "B" which is fixing the paper release lever.

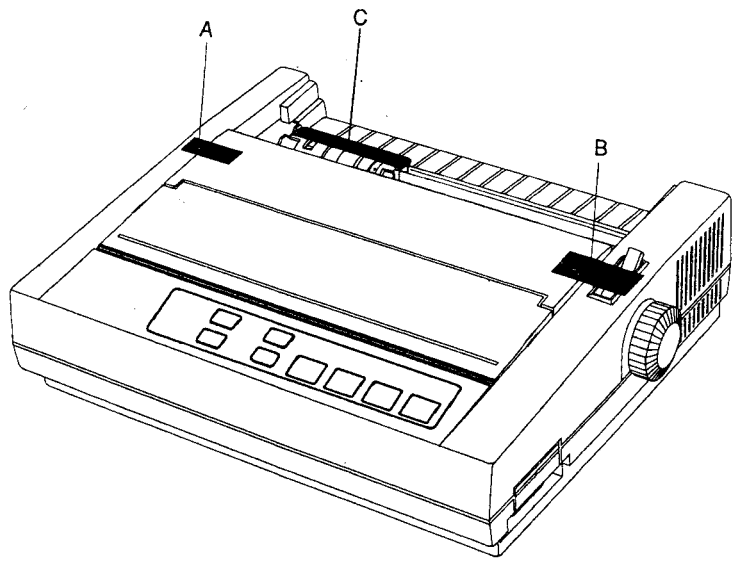


Fig. 2-3 Removing the Tapes

2. After you have removed all tapes, open the cover and remove the carriage card board placed on the right corner which is fixing the print head.

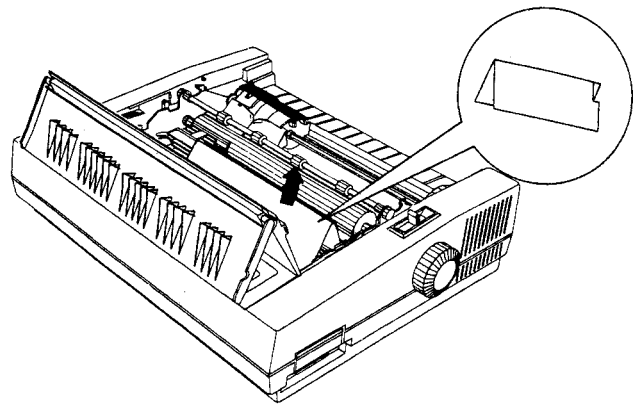


Fig. 2-4 Removing the Carriage Card Board

3 After removing carriage card board, move the print head a little back and forth to make sure it moves smoothly. Then remove the tape "C" placed on the sprocket cover.

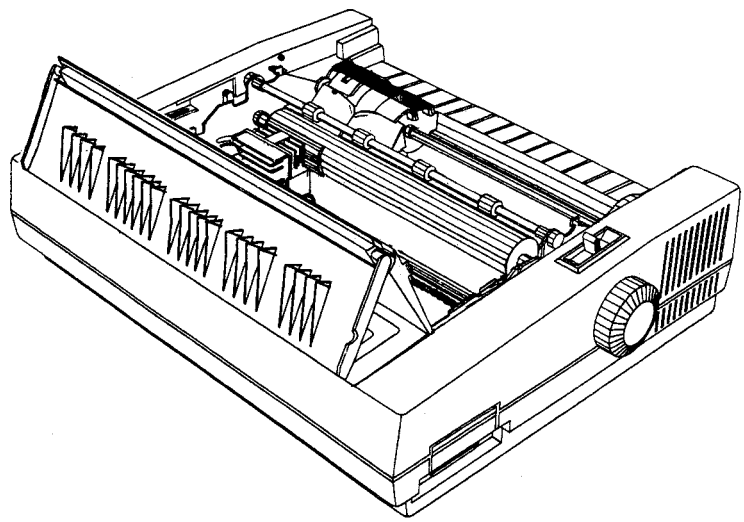


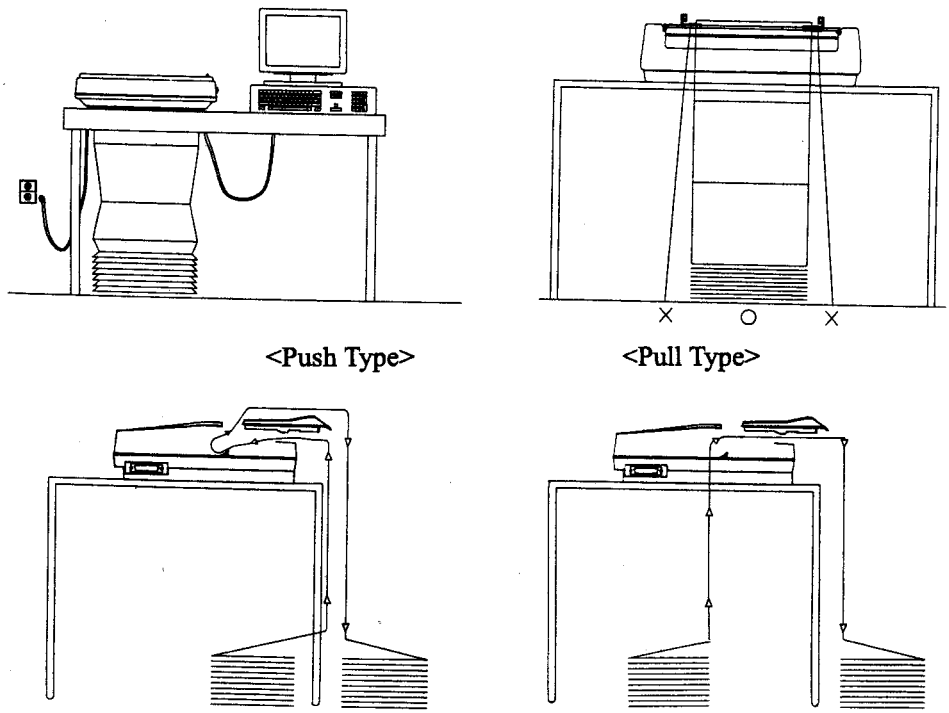
Fig. 2-5 Removing the Tape "C"

2.2 Choosing a place for the Printer

There are several things that should be considered before installing your printer. Please keep the followings in mind to ensure proper operation of the printer:

- Place the printer on a bench, table top or any other convenient flat surface with enough room for the separator in the back of the printer.
- Do not use the electrical outlet which is on the same circuit with air conditioner, fluorescent lamp, electrostatic copier or shredder.
- Avoid operating the printer in places where it may be exposed to direct sunlight. If you have to use the printer in such a place, install a blind or curtain to protect ink from direct sunlight.
- Do not install the printer near devices containing magnets or generating magnetic fields.
- Avoid operating the printer in places where a great deal of dust exists in the air. Dust accumulation may cause the malfunction of the printer.
- Do not place object on the top of the printer.
- Do not operate the printer below 5° C (41° F) or above 35° C (95°), or humidity below 10% or above 80%. Also, sudden changes in temperature and humidity must be avoided.

When you use continuous papers, we recommend that you install the paper as shown in figure 2-6.



<Push Type> <Pull Type>

Fig. 2-6 Using Continuous Papers

2.3 Assembling the Printer

2.3.1 Installing the Ribbon Cartridge

The printer cover must be opened before you can insert the ribbon cartridge.

Install the ribbon cartridge in the following procedures:

1. Make sure that the printer is turned off. Slide the print head to the middle of the printer.

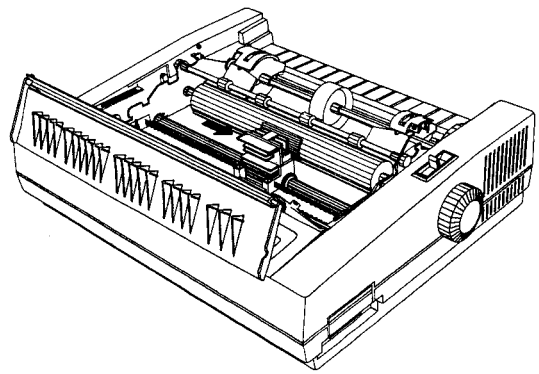


Fig. 2-7 Moving the Print Head to Center

2. Turn the ribbon-tightening knob in the direction of the arrow to tighten the ribbon. This step removes excess slack in the ribbon and makes it easier to install.

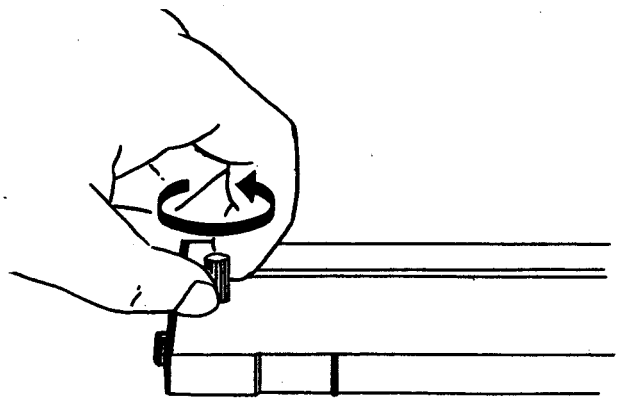


Fig. 2-8 Tightening the Ribbon Knob

3. Hold the ribbon cartridge horizontally by its back and push the cartridge into the printer with the exposed side of the cartridge away from you. Make sure that the hooks on each side fit into the slots inside the printer and the hole on the bottom of the cartridge fits into the ribbon spindle.

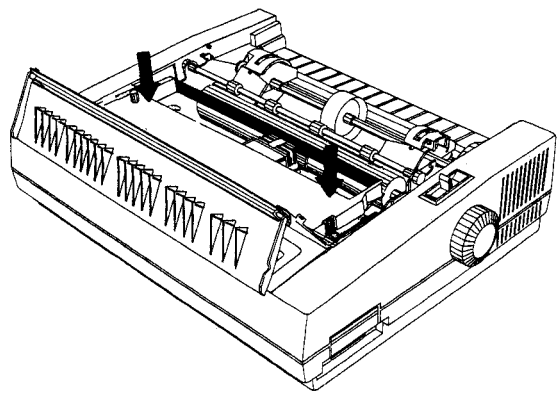


Fig. 2-9 Inserting the Ribbon Cartridge

4. Insert the exposed ribbon between the print head and the ribbon guide and turn the ribbon-tightening knob so that the ribbon does not slip out.

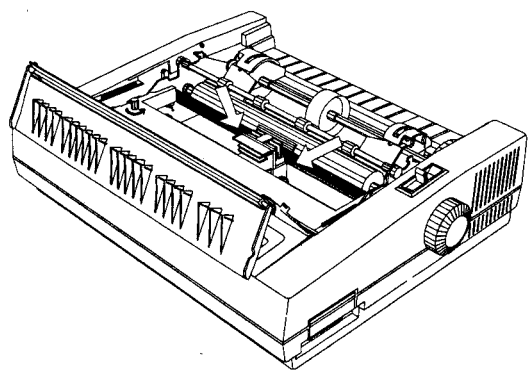


Fig. 2-10 Inserting the Exposed Ribbon

NOTE

You may want to use gloves or pointed objects to avoid ink stains on your hand.

5. Check your installation by moving the print head back and forth and make sure that the ribbon does not twist or crease.

If the ribbon is not installed properly between the print head and the ribbon guide, it may cause distorted printing.

2.3.2 Installing the Paper Guide

The paper guide is used for two purposes. When raised, it works as the single sheet paper guide and when lowered, it acts as a separator of the continuous paper between before and after the tractor feed.

To install the paper guide for cut sheet papers, follow the procedures listed below:

1. Set the paper release lever on the right side to the middle position. The lever must be in this position to have the cut sheets fed into the printer by friction.

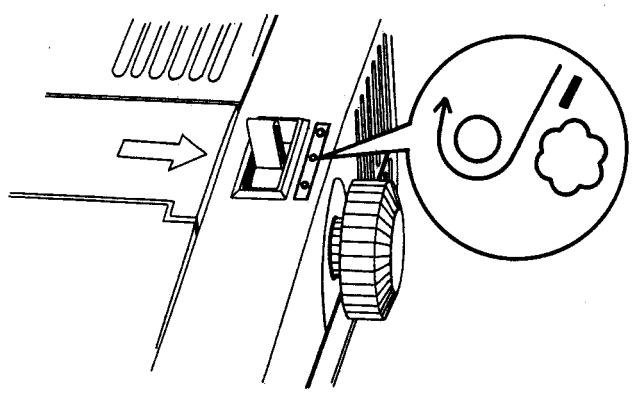


Fig. 2-11 Placing the Release Lever to Middle

2. Place the paper guide on the printer with the slots in each side inserted. And raise the paper guide up until it locks in place.

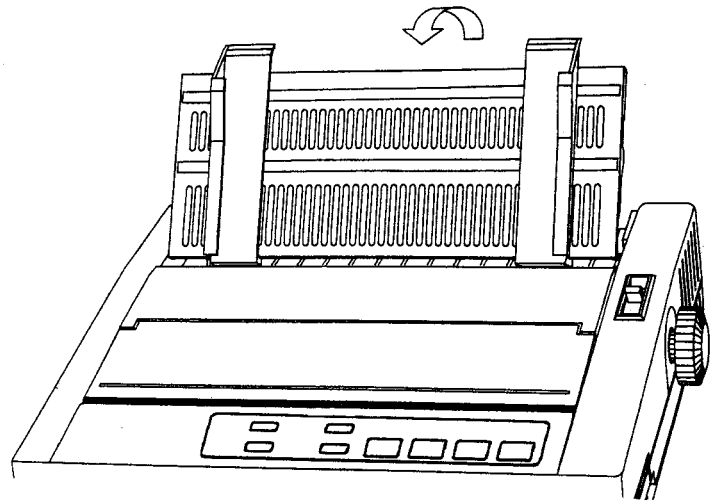


Fig. 2-12 Raising the Paper Guide Up

3. Adjust the edge guide to fit to the size of the cut sheet paper

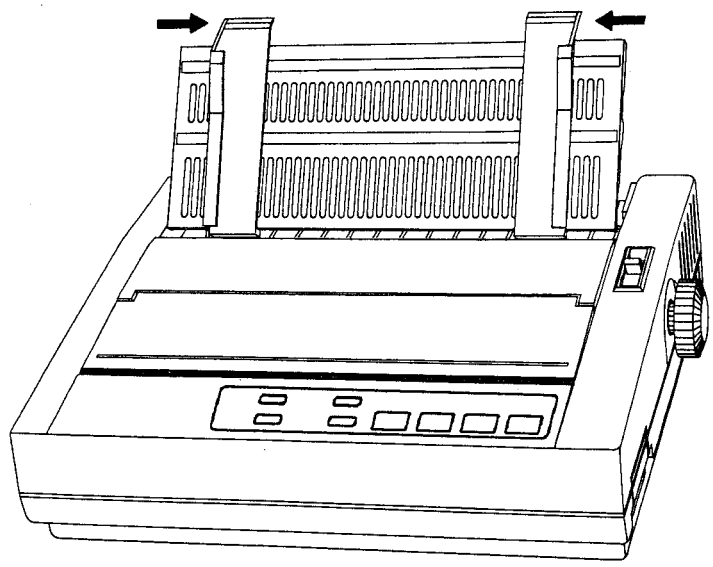


Fig. 2-13 Adjusting the Edge Guides

To install the paper guide for continuous papers, follow these procedures.

1. Set the paper release lever on the right side to forward (push type) or to backward(pull type) position.

2. Lift the raised paper guide softly and lower it toward back until it locks in place.

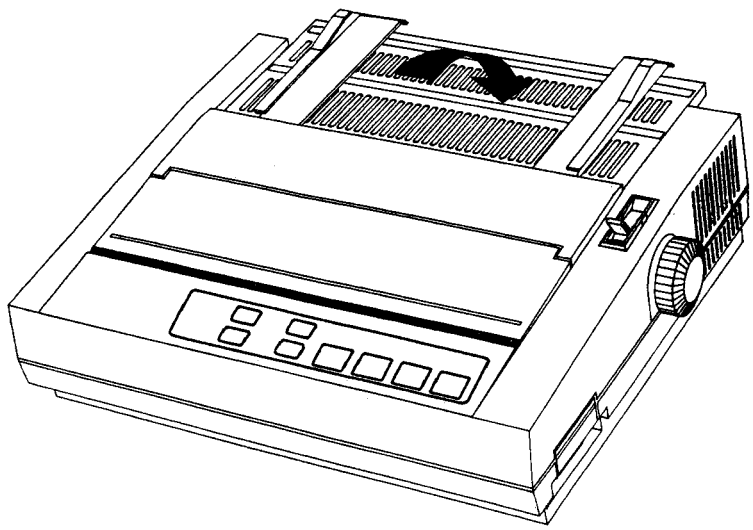


Fig. 2-14 Lowering the Paper Guide

NOTE

When the paper guide is not in use, it can be lowered and locked into place to serve as a protective cover.

2.4 Testing the printer

After you have fully assembled your printer, you may run a self test to make sure that the printer was not damaged during transportation and the printer ribbon cartridge has been correctly inserted.

In order to run the self test, you don't have to hook the printer to the computer.

Before running this test, all the protective materials in the printer should be removed. Switching the printer on with the print head fixture installed can cause irreparable damage to the printer mechanism.

2.4.1 Plugging in the printer

Make sure that the printer is turned off. Then check the label on the back of the printer to make sure that the power rating required by the printer matches with that of your electrical outlet.

If the rated voltage and your outlet voltage do not match, contact the nearest dealer for assistance. Do not plug in the power cable.

2.4.2 Loading a Sheet of Paper

To load a sheet of paper, follow the procedure listed below:

1. Make sure that the switch is turned off. Then plug the power cord into a properly grounded electrical outlet.

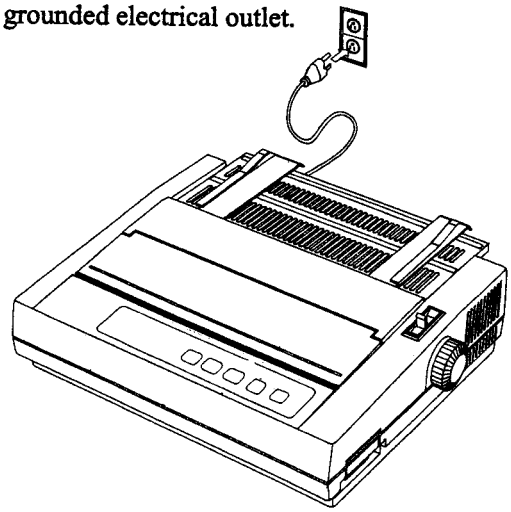


Fig. 2-15 Connecting the Power Cord

2. Switch the printer ON. The power switch is on the left side of the printer.

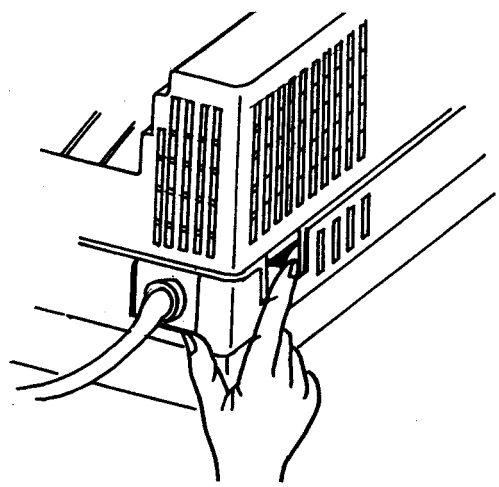


Fig. 2-16 Switching the Power ON

3. Then the green ON LINE light on the control panel comes on, indicating that the printer is powered on. This LED will be blinking if the paper is notinstalled.

4. Make sure the paper release lever is in the cut sheet position (middle).

5. Raise the paper guide and adjust the edge guides to the size of paper to be loaded. Then slide the paper in parallel to the edge guides until you feel resistance.

The socket-outlet shall be installed near the equipment and shall by easily accessible.

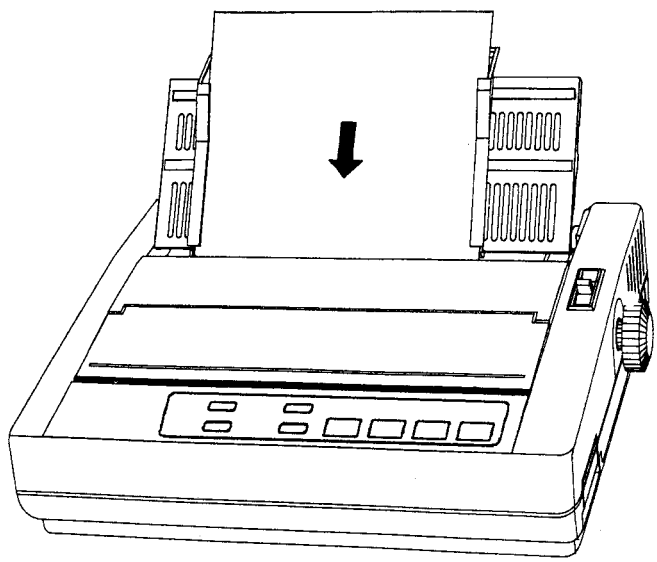


Fig. 2-17 Inserting the Cut Sheet Paper

NOTE

Be sure to set the paper release lever to the cut sheet position. If it's not set correctly, the paper will not move.

When loading the paper, you must insert the paper into the printer until you feel resistance. If you don't insert the paper completely, the loading failure can happen.

6. Press the PARK/LOAD button on the control panel. The paper will be automatically loaded to the printing start position.

2.4.3 Running the Self Test

Now you are ready to start the actual printer test. This allows you to test the printer independent of the computer.

In order to have a self test, first turn the printer OFF with a cut sheet loaded in the printer. And then follow the procedures listed below.

1. While holding the LINE FEED button on the control panel, turn the printer ON. Stop pressing when the printer starts to operate.

2. The printer should start printing the selected print mode settings and ASCII pattern samples.

```
                    * INITIAL SETTINGS *

[Group]          [Item]        [Select : Current settings are <...>]

G1      Font         <Draft> Roman Sanserif Courier Gothic Elite
        Pitch        <10> 12 15 17 20 PS
        P.Length     <11"> 11 2/3" 12" 14" 15" 8" 6"
        Cha.Set      <Set1> Set2 Set3(Italics)
        Emulation    <EPSON> IBM
        Grph.dir     <Uni> Bi
        Zero Cha.    <Unslashed> Slashed
        Code Page    <#437> #850 #860 #861 #863 #865
        Country      <U.S.A.> France Germany U.K.  Denmark1 Sweden
                     Italy Spain1 Japan Norway Denmark2 Spain2
                     Latin-America Legal
        DOWN LD.     <Disable> Enable

G2      ACSF         <Off> On
        LPI          <6Lpi> 8Lpi
        Autotear     <Off> On
        Auto LF      <Off> On
        Auto CR      <Off> On
        1" Skip      Off On
        LQ_Vtcl      -2.5 -2 -1.5 -1 -0.5 0 +0.5 +1 +1.5 <+2> +2.5
        DT_Vtcl      -2.5 -2 -1.5 -1 -0.5 0 +0.5 +1 +1.5 <+2> +2.5

G3      Interface    <Centronics> RS-232C
        Protocol     <XON/XOFF> DTR/DSR
        Parity       <None> Odd Even
        Data         <8Bit> 7Bit
        Baud Rate    <9600> 4800 2400 1200 600 300 150

US 1.0(1993.2.15)

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!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijk
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcbefghijklm
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
```

Fig. 2-18 Self Test Printout

Once the self test starts, it won't stop until you turn the power switch off.

2.5 Connecting the Interface Cable

This printer has a default standard Centronics interface. If you would prefer optional RS-232C serial interface, please refer to section 5.2.

On the right side of the printer, you can find a socket for parallel interface cable.

Follow these steps to connect the interface cable.

1. Make sure both the computer and the printer are turnedoff.

Connecting the cable with the power switched on may cause damage to the printer and/or the computer.

2. Insert the cable connector into the socket as shown below and squeeze the wire dips together until they ock onto either side of the connector. If your cable has a ground wire, attach this wire to the ground connector of the printer. Make sure that you place the correct end of the cable into the printer socket.

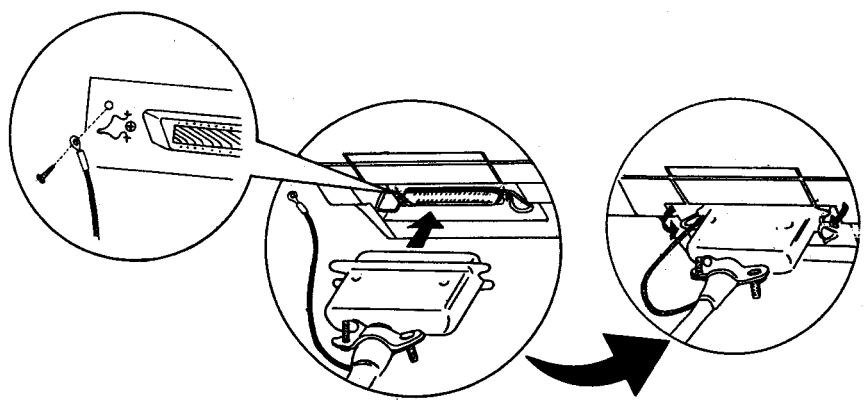


Fig. 2-19 Installing Cable Connector

3. Plug the other end of the interface cable into the computer.

2.6 Using Single Sheets

The paper handling mechanism of this printer lets you use both the cut sheet paper and the continuous roll papers which use the tractors.

The paper release lever on the top right side of the printer offers you 3 choices, cut sheet, push tractor and pull tractor. Its position and the corresponding paper paths are shown below, so that you can adjust this lever according to the type of the paper to use.

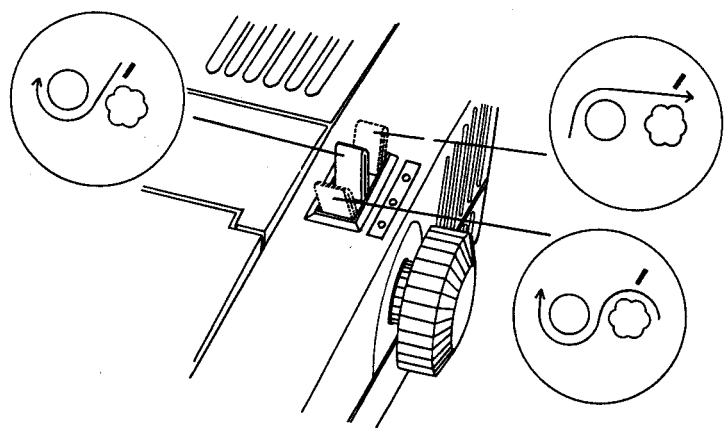


Fig. 2-20 Paper Release Lever Position and the Corresponding Paper Path

This printer can handle a wide range of paper size up to maximum of 11" wide. Always make sure that your printing is limited to the size of paper in use. Avoid the direct printing on the platen (black roller) at any case.

If you use the single sheets a lot in everyday life, you may find it more convenient to install an Automatic Cut Sheet Feeder (abbreviated ACSF) which can hold up to 100 single sheets to supply whenever required.

To load a cut sheet paper, follow these steps.

1. Raise the paper guide up.

2. Place the paper release lever to the cut sheet position (middle).

3. Adjust the edge guides to the size of paper to be loaded. Slide the paper consistently with the edge guides all the way in until it touches the platen. The ERROR light is off.

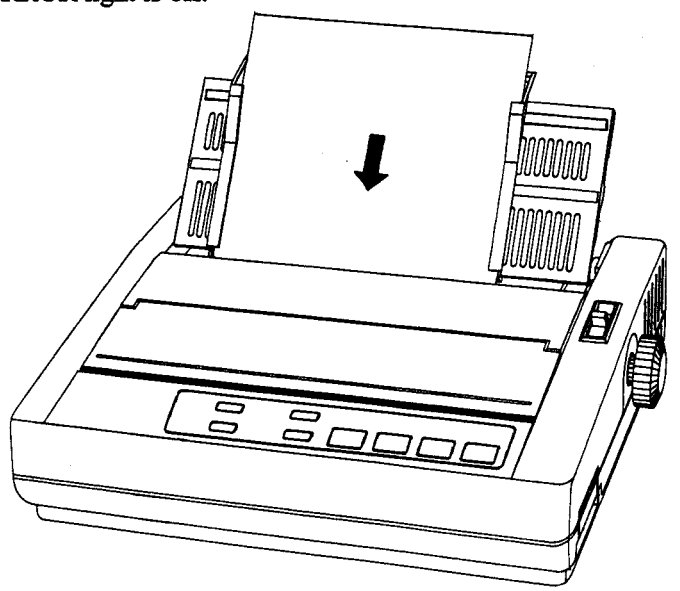


Fig. 2-21 Inserting a Cut Sheet Paper

4. Press the PARK/LOAD button on the control panel. The paper will automatically advance to the first printing position.

5. Press the ON LINE button, and you are ready to print.

6. In order to eject the paper after loaded, press the PARK/LOAD button again in OFF LINE. In order to load the paper, follow the previous steps.

Do not turn the platen knob with power ON.

2.7 Using Continuous Paper

You have two choices of handling the continuous paper, the rear feed in push tractor mode and the bottom feed in pull tractor mode.

2.7.1 Rear Feed in Push Tractor mode

Follow these steps to load the paper in push tractor mode.

1. Turn on the printer
2. Take the paper guide out of the printer.
3. Place the paper release lever in PUSH TRACTOR position (forward).
4. Move the tractor paper support to the center position.

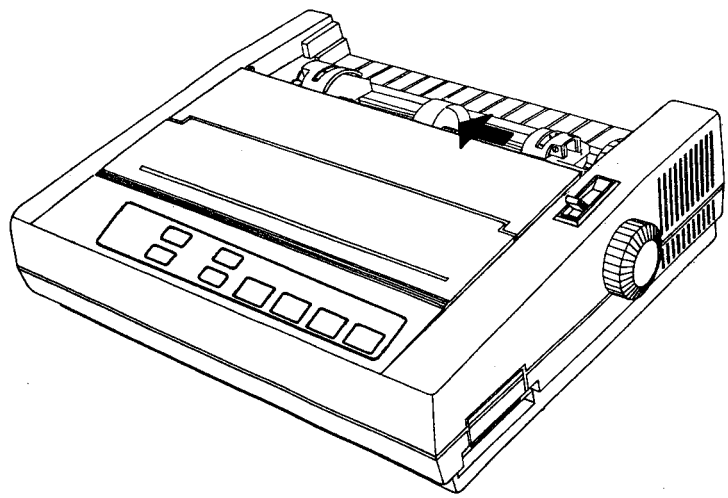


Fig. 2-22 Moving the Paper Support

5. Lift the sprocket covers of the tractor and adjust the tractors to the size of the continuous paper in use.

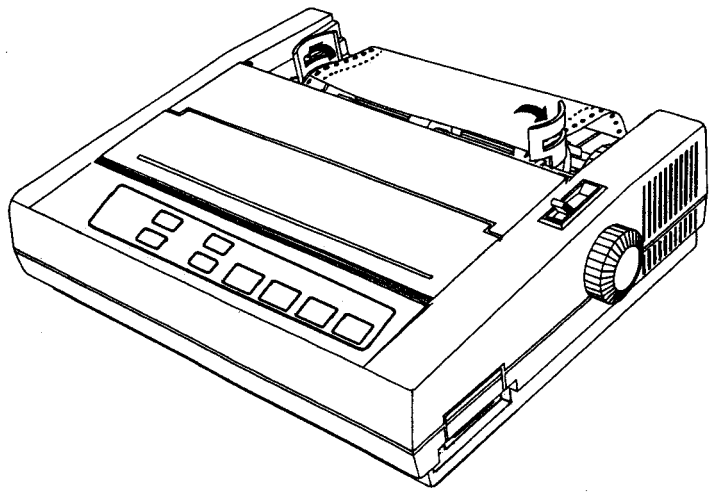


Fig. 2-23 Lifting Sprocket Covers

6. Fit the first few paper holes over pins of each sprocket, and close the sprocket covers. Slide the sprocket outward to make sure that the paper is straight, even and has no wrinkles.

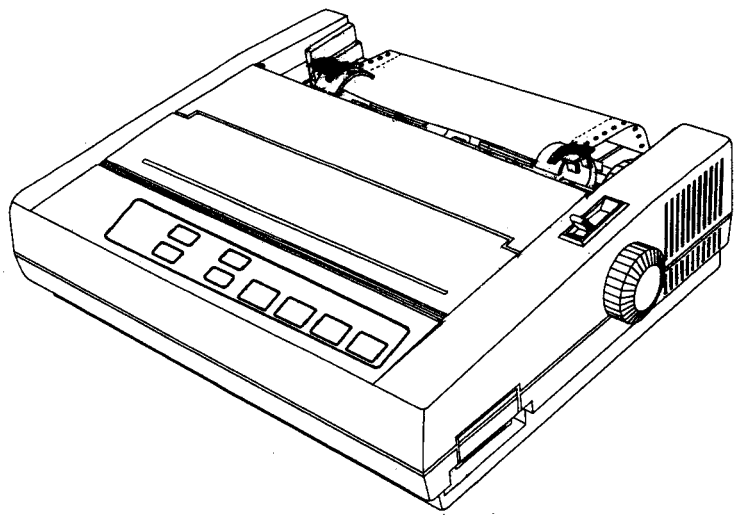


Fig. 2-24 Closing the Sprocket Covers

7. Place the paper guide in lower position. Adjust the edge guides for the paper to pass over them.

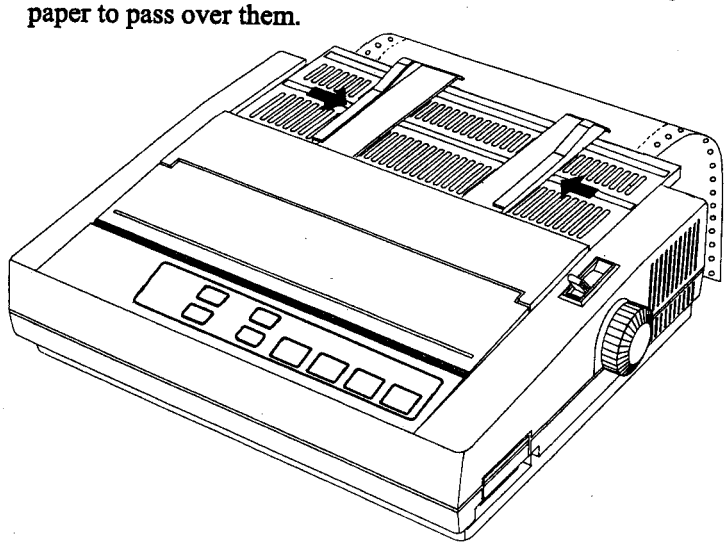


Fig. 2-25 Adjusting the Edge Guides

8. Press the PARK/LOAD button on the control panel to advance the paper to the first printing position.

9. Press the ON-LINE button, then you are ready to print.

IF YOU WANT TO ALIGN THE TOP OF FORM POSITION SLIGHTLY, USE THE MICRO-ADJUSTMENT FUNCTION BY LINE FEED AND FORM FEED BUTTONS.

2.7.2 Bottom Feed in Pull Tractor mode

Follow these steps to load the paper from the bottom of the printer.

1. Turn the power switch ON.

2. Open the top cover and remove the paper guide.

3. Open the sprocket covers.

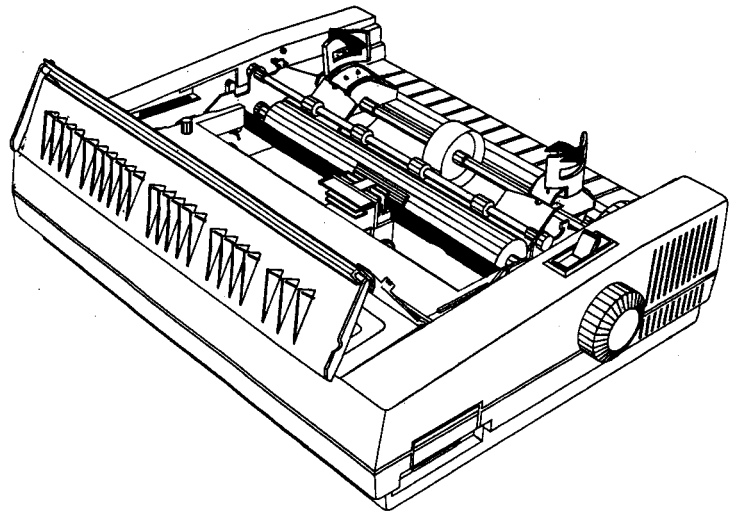


Fig. 2-26 Opening the Sprocket Covers

4. Place the paper release lever in the PULL TRACTOR position (backward).
5. Move the tractor paper support to the center of the printer. Insert the paper from the bottom opening of the printer and push the paper up between the bail and platen, then pull the paper under the bail roller until it reaches the tractor pins.

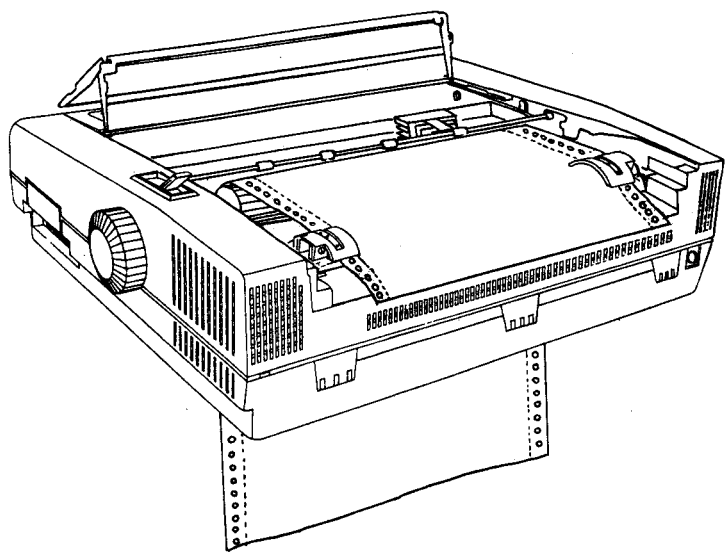


Fig. 2-27 Pulling the Paper

6. Adjust the tractor positions to the paper width, and align the paper sprocket holes with the tractor pins.

7. Close the sprocket covers.

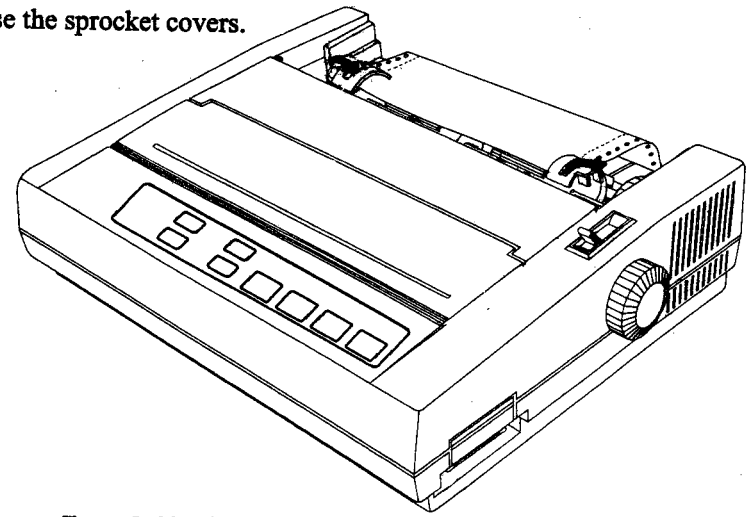


Fig. 2-28 Closing the Sprocket Covers

8. Adjust the tractor and paper in order not to have any vertical or horizontal wrinkles.

9. Place the paper guide in lower position.

10. Close the top cover and adjust the first printing position.

11. Press the ON LINE button and it's ready to print.

1. PARK/LOAD button will not operate in PULL TRACTOR position.
2. When you use multiple copies of carbon paper, you can get a better printing quality in PULL TRACTOR feed.
3. But PULL TRACTOR feed does not work well in the printing styles which require backward feed.
   e.g ESC W in Epson
   ESC [@ in IBM mode

2.8 Switching between Continuous and Cut Sheet Paper

Even with the continuous paper loaded in the printer, you can easily switch to single sheet printing without completely removing the continuous paper.

2.8.1 Switching to Single Sheets

Follow these steps to switch from continuous paper to single sheets.

1. Go into OFF LINE by pressing ON LINE button, and press the FEED button for more than 1 second to tear off the printed page.

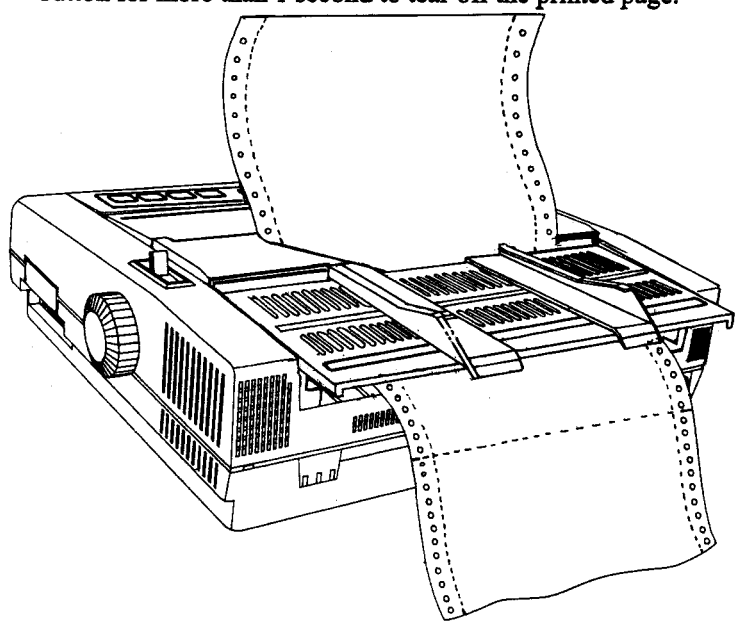


Fig. 2-29 Tearing Off the Printed Sheet

2. Press the PARK/LOAD button to feed the continuous paper into a standby position. In the standby position, the paper is still engaged with the tractor, but the tractor will be disengaged from the paper feed motor so that the paper will not move. The ERROR LED should light to indicate the paper is empty.

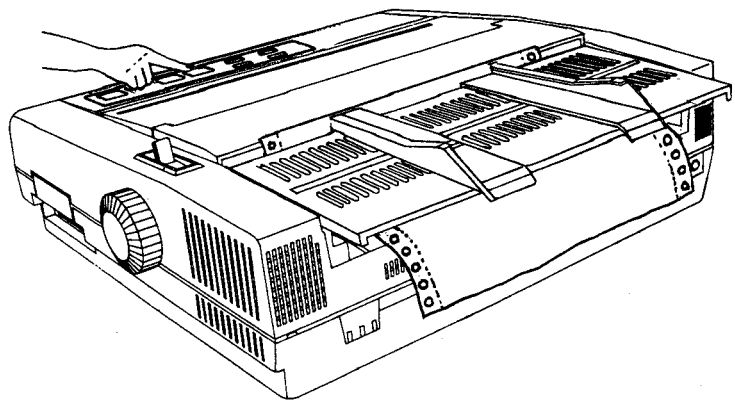


Fig. 2-30 Parking the Remaining Continuous Paper

3. Place the paper release lever in the CUT SHEET position (middle).

4. Raise the paper guide up, and adjust the edge guides to the width of paper in use.

5. Insert the paper between the edge guides until you feel resistance.

6. Press the PARK/LOAD button to load the paper to printing start position.

7. Press the ON LINE button, and it's ready to print.

2.8.2 Switching back to Continuous Paper

Follow these steps to switch from single sheet paper to continuous paper.

1. Remove all single sheets. Lower the paper guide, and then adjust the edge guides.

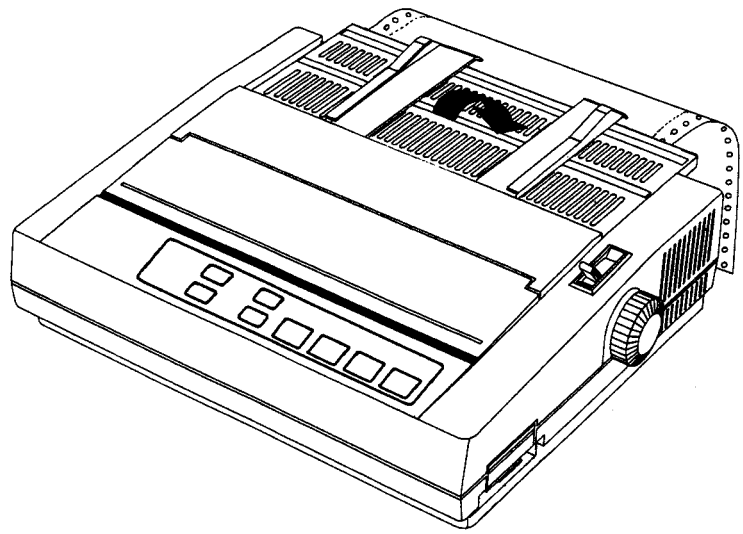


Fig. 2-31 Lowering the Paper Guide

2. Place the paper release lever in the PUSH TRACTOR position (forward).

3. Go to OFF LINE and Press the PARK/LOAD button to load the continuous paper.

4. Press the ON-LINE button, and it's ready to print.

2.9 Using the Tear-Off Feature

If you use the continuous paper in push position, you can tear off the perforated sheets quickly and smoothly without wasting a sheet of paper, using the tear-bar on the top cover.

In Autotear ON state, Autotear is performed whenever the printer receives a full page of data or a form feed, and no more data is received for the 3 seconds.

NOTE

If you don't like this feature, you can disable it through the Initial Mode Settings change procedure. When Autotear is on state, a tear off key on the pannel in is not worked.

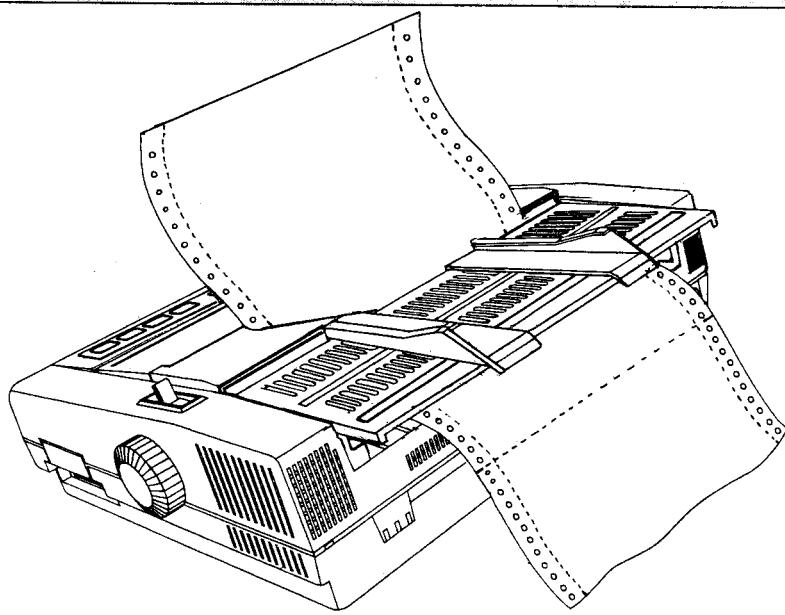


Fig. 2-32 Tearing Off the Paper

2.10 Adjusting the Head Gap Lever

There are several kinds of papers you can use for printing such as multi-part forms, labels and even envelopes. For printing on these special papers, you had better adjust the print head gap for the best printing quality.

To accommodate this printer to papers of different thickness, it has a head gap lever to supply 6 different level of choices which is identified by the scale mark on the next to the lever. For normal use, the lever should be set to position 2 on the scale.

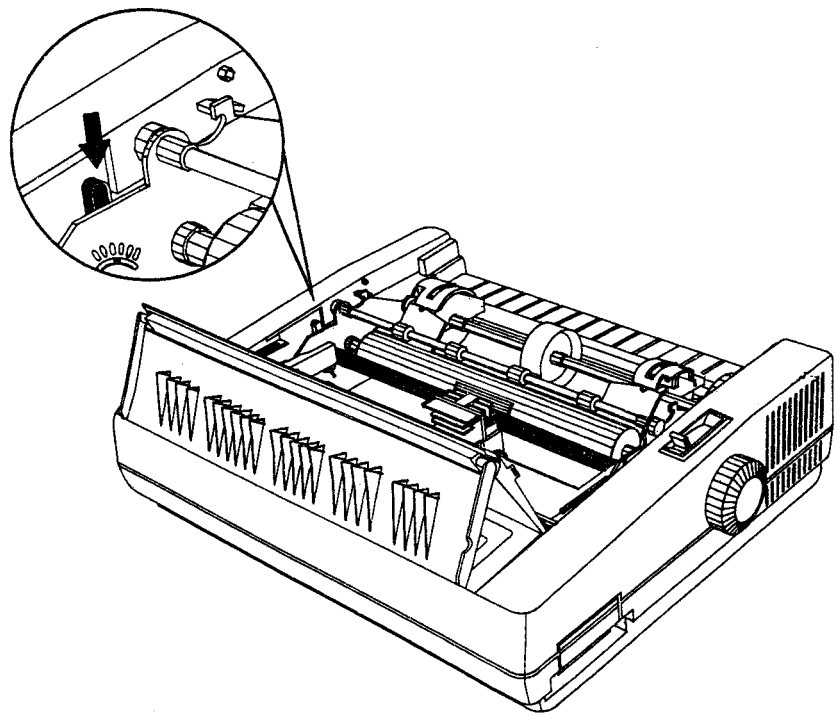


Fig. 2-33 Head Gap Lever Position

The following table gives a brief idea of selecting the head gap position according to the paper.

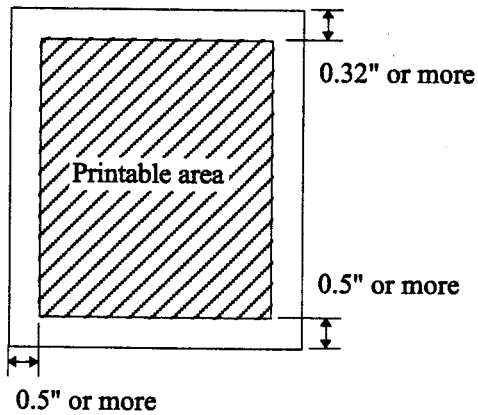
Paper Type	Lever Position
Paper (single or continuous)	2 ~ 3
Thin Paper	2 ~ 1
Multi-part Paper	
2-sheet	3 ~ 4
3-sheet	4 ~ 6
4-sheet	4 ~ 6
Label	4 ~ 6
Envelopes	
Air Mail	4 ~ 6
Plain	4 ~ 6
Bond(20 lb)	4 ~ 6
Bond(24 lb)	4 ~ 6

1. If an ink smear occurs when loading paper or during printing, move the lever toward the lower position until the smear no longer appears.

2. printing past the edge of papers and/or envelopes can shorten the life of print head and can even damage it.

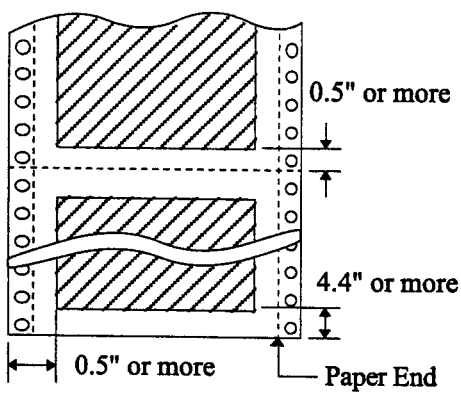
2.11 Printable Area

2.11.1 Single Sheet

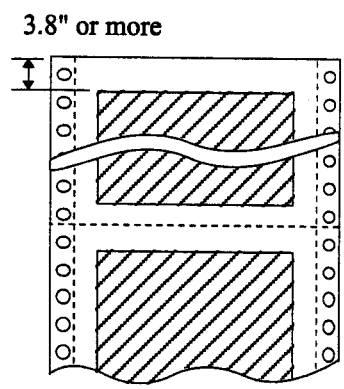


2.11.2 Continuous Paper

a. Push Type



b. Pull Type



2.12 Options

2.12.1 Automatic Cut Sheet Feeder

If you are a frequent user of single sheet paper for printing, you may find it much more convenient to install the Automatic Cut Sheet Feeder (ACSF).

The ACSF lets you stack up to 100 sheets for automatic loading and frees you from the burden of reloading single sheet each time. Contact your dealer for more information on the cut sheet feeder.

2.12.2 RS-232C Serial Interface

This printer has an optional serial interface board which lets you communicate with any type of computer which does not have a Centronics interface. Refer to section 5.2 for more information on serial interface.

2.12.3 Optional Buffer

If you need a big printer input buffer or download buffer, you can install an optional 32K bytes buffer, which goes into the blank socket under the blank plastic cover where the printhead cable comes out.

NOTE

Down LD is Enable State	*input buffer*	*: 24K bytes*
	download buffer	*: 16K bytes*
Down LD is Disable state	*input buffer*	*: 40K bytes*

Chapter 3

OPERATION

3.1 Switches and indicators

- Power switch

  The power switch is located on the left side of the Printer. It is used to turn the printer ON or OFF.

NOTE

Turn ON the power switch 2 or 3 seconds after you switched it OFF.

- Selection buttons on front panel

  There are 8 panel selection buttons on the front panel.

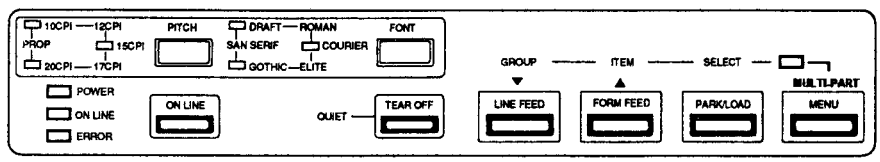


Fig 3.1 Key Buttons and LEDs on Front Panel

- ON LINE button

  This is an alternate action button which opens and closes the communication line between printer and the computer.

  ON LINE — ON LINE indicator lit can receive data from host computer.

  OFF LINE — ON LINE indicator goes out. can not receive data from host computer. Paper empty condition forces the printer to stay in OFF LINE.

■ MENU button

This button is used for changing the initial settings of the printer. It is effective only in off line mode. When this button is pressed it prints a message on the paper notifying you that the printer is in the initial setup mode. The initial setup mode is described in more detail in the following section. This button is used for selecting multi-part from or single-part from printing. When this button is pressed in ONLINE, immediately after the printer has been power up, multi-part LED goes from OFF to ON or from ON to OFF. With the multi-part LED ON, the printer is able to print multi-part form. While if this LED is OFF, the single-part form can be used.

■ LINE FEED button

This button has following three functions;

Line Feed : In the off line status, it feeds paper by one line.

Self-test : When this button is pressed while turning on the power of the printer, the self-test starts. Then release this button.

GROUP select : In the initial setup mode, it is used for selecting the GROUP. The initial setup mode is described in more detail in the following section.

Pressing this in ON LINE retracts the paper a little backward(REVERSE MICROFEED). Refer to section 3.6 for more information on micro adjustment.

■ FORM FEED button

This button has following three functions;

Form Feed : In the off line status, it feeds paper by one page.

Hex Dump : When this button is pressed while turning on the printer, the printer is set to Hex dump mode. The Hex dump mode is described in more detail in the following Hex dump section.

ITEM select : In the initial setup mode, it is used for selecting the ITEM. The initial setup mode is described in more detail in the following section.

Pressing this in ON LINE retracts the paper a little backward (FORWARD MICROFEED). Refer to section 3.6 for more information on micro adjustment.

■ PARK/LOAD button

When the continuous paper is loaded initially, pressing this button causes the paper to be loaded at the Top of Form position. When the continuous paper is already loaded, this button is used as the parking button for removing the paper. As for cut sheet paper this button operates as load and eject button by toggle. Note that this feature must be used in off line state and is not available in pull type paper handling. In the initial setup mode, it is used for selecting the SELECT. The initial setup mode is described in move detail in the following section.

■ QUIET/TEAR OFF button

This button performs two different functions depending on the printer's on line/off line status.

In on line status : This button is used for selecting quiet mode. This mode reduces the noise produced by the printer by slowing the printing speed. The button toggles between quite and regular mode.

In off line status : The button is used for feeding the paper to TEAR OFF. When this button is pressed after printing, the continuous paper is fed to the tear-off edge of the top cover so that you can tear off the last sheet. Pressing it again returns the paper to Top of Form position for printing. Note that this feature is not available in pull type paper handling and the cut sheet mode. And this feature is available only in push type paper handling.

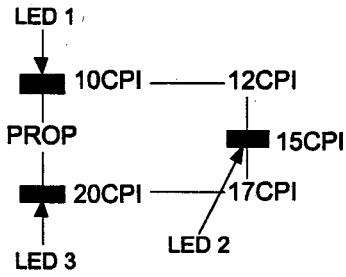
NOTE

Finishing the micro-adjustment, the printer recognizes the current printed position as the Top-Of-Form(*).

■ Selecting typestyles

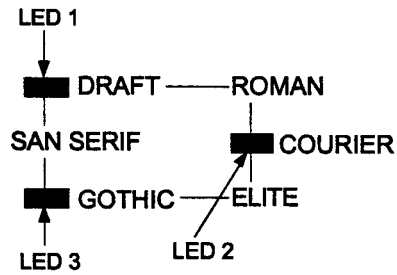
- Character Pitch Selection

  PITCH Select Button is used for selecting the pitch - 10, 12, 15, 17, 20 CPI and PROP of the printer. And the current pitch is indicated by association of the 3-Pitch Select Lights as shown below.



PITCH	LED 1	LED 2	LED 3
10 CPI	ON	OFF	OFF
12 CPI	ON	ON	OFF
15 CPI	OFF	ON	OFF
17 CPI	OFF	ON	ON
20 CPI	OFF	OFF	ON
PROP	ON	OFF	ON

- Character Font Selection
  FONT Select Button is used for selecting the font - Draft, Roman, Sanserif, Courier, Letter, Gothic, Prestige Elite - of the printer. The current font is indicated by combination of the 3 - Font Select Lights as shown below.



FONT	LED 1	LED 2	LED 3
DRAFT	ON	OFF	OFF
ROMAN	ON	ON	OFF
COURIER	OFF	ON	OFF
ELITE	OFF	ON	ON
GOTHIC	OFF	OFF	ON
SAN SERIF	ON	OFF	ON

NOTE
The Draft font and the PROP pitch cannot be selected simultaneously.

3.2 Detectors

- PAPER OUT Detectors
  One PAPER OUT Detector is located behind the platen to detect the paper out status in push tractor and friction feed mode, and the other is located on the way of bottom paper path to detect the paper ou status in pull tractor mode.

- HOME POSITION Detector
  On the left under of the platen locates a sensor which is used when there is a need to reset the printhead position.

- LEVER Detectors
  On the left side frame, there are 2 mechanical switches to detect the tractor mode which is one of the push tractor, pull tractor and friction feed.

3.3 Non-Volatile RAM

The Non-Volatile RAM is a read/write memory where we can store the operating parameters permanently. You can change the corresponding contents of NVRAM by keypad control. By changing the operating parameters and store it permanently, you can have your preferred mode be ready every time you turn on the printer power. APPENDIX A shows the summary of NVRAM setting meanings and the procedures of how to change these settings.

3.4 Self Test

The printer has a self test feature which allows the user to test the printer independent of the computer, which is activated by turning the power on while holding the LINE FEED key.

3.5 Hex Dump

The Hex Dump mode is activated by turning the power on while pressing FORM FEED buttons. In this mode, all data received from the computer are printed in hexadecimal code rather than the normal ASCII characters. Control codes for the printer (CR, LF, HT, VT, etc) are not executed. To reset this mode, turn the power off, then back on. This mode is useful when the programmer is debugging his program for the printer or if the user suspects a problem with the printer and wants to check if the printer is working correctly.

3.6 Micro Adjustment

By pressing the FORM FEED (forward ▲) and LINE FEED (backward ▼) buttons immediately after loading paper and when the printer is on line, you can move the paper at a time for fine adjustments to the Top of Form positions. Note that at maximum (minimum) position of the paper doesn't change in spite of pressing the FORM FEED (LINE FEED) button. The default value of minimum position is 0" and maximum position is 1". So you can adjust TOF position to 1". But, it is not worked after data was received.

Chapter 4

SOFTWARE COMMAND CONTROL

4.1 Introduction

In order for a computer to communicate with a printer, both pieces of equipment must understand the common language or coding scheme. One common coding scheme extensively used is ASCII (American Standard Code for Information Interchange).

For example, the English character "A" is represented any of following forms:

Decimal : 65D, 65DEC
Hexadecimal : 41H, 41HEX
Binary : (01000001)B, (01000001)2

Most computers in these days allow the user to enter the ASCII code in either Decimal or Hexadecimal form. Once entered, the ASCII codes are converted to binary form by the computer and then sent to the printer. In the following sections, you will see how to enter various ASCII codes to enable the printer to perform the functions you want. Since the decimal equivalent of the ASCII code is most commonly used, all examples which follow will use the decimal form. Appendix B contains the ASCII characters and the control command tables used by the printer.

4.2 Control Codes

The fundamental task of the printer is to print the ASCII characters according to the inputs of the computer. Now, let's say, how can we do if we want to print the graphics image with this printer, or if we want to change the various printing conditions which is not accessible from the front panel, like changing the line length, etc ? For these purposes, the printer is programmed to understand the several control codes besides the printable ASCII characters. The various printer functions are set through the use of control codes, which consist of one or more ASCII characters entered by the computer in a special way. The control codes often differ from printer to printer, and from this fact, the word, Epson Emulation or IBM Emulation, arises. Control codes generally fall into two categories: one-byte control codes and multi-byte control codes. The multi-byte control codes ate commonly referred to as Escape Sequences since each code begins with the ASCII code for the ESCAPE character(ESC, Decimal 27D, Hexadecimal 1BH). Control codes can be sent to the printer from your computer in different ways.

The three most common ways are:

- Through commercial software packages
- Directly from the keyboard (within BASIC interpreter program)
- From within a user-written program.

The last two methods will specifically reference the BASIC language, although other languages such as FORTRAN, PASCAL, C, etc, can also be used. We will use BASIC since it is a relatively easy language and is the most commonly used language in Personal Computer world.

4.3 Using the Printer with Application Programs

Many computer users do not have time, expertise, or the interest to develop software packages suited for their own application. In such cases, the softwares written by professionals can be purchased. Such software should be selected not only to meet the needs of the user, but must also be compatible with both computer and printer.

- Printer Selection Menus

  Most application programs ask you to specify the name or brand of the printer you're using to take full advantage of the printer's features. Many programs provide a setup or installation procedure that presents a list of printers. If your application program has a printer selection menu, use the following instructions.

- Menu Selections

  If your software has a printer selection menu, simply choose Epson LQ-850 or IBM Proprinter X24E. If the menu does not list either of these, choose one of the followings. They are listed in order of preference.

Epson Emulation	IBM Emulation
LQ-850/950/1050	IBM Proprinter X24E
LQ-2500	IBM Proprinter XL24
LQ-800/1000	IBM Proprinter
LQ-1500	Standard Printer
EPSON Printer	
Standard Printer	
Draft Printer	

- Wordprocessors

  In many ways, wordprocessors demand the most from your printer. When you create and print a document, you may use any print styles and fonts, reformat pages, add headers and footers, and use bold, italic, and other effects. Once you have installed your wordprocessor by using the printer lists, you can ordinarily use a fixed set of printer features by

using wordprocessor commands to place markers around the text to be altered. When the document is printed, the markers are recognized and translated into suitable commands for your printer. On your screen, some programs show the markers in a distinctive way, while others display the text as it will appear - for example, in bold or italics. This method is normally restricted to features that can be found on almost all printers, such as bold and underlining. Some programs also provide a way of placing complete printer commands in the text. The commands may or may not be visible on your screen. This method has the advantage of allowing you to use any printer command, not just a limited set. To make use of it, however, you need to understand how to use the printer's commands.

- Spreadsheets

  Although spreadsheets seldom use as many printing styles as wordprocessors, they do have some very specific requirements. If your spreadsheet program provides a list of printers, use the list on previous page to help select the printers. If your spreadsheet does have a printer setup routine, carefully read the program manual for information on printing. A major concern for printing spreadsheets is the width of the printer. This printer can print up to 80 column. However, by using the compressed mode, it can print up to 160 column on one line. Therefore, if your spreadsheet asks the number of columns your printer can print, you can specify 160.

- Graphics Programs

  This printer is capable of producing finely detailed black and white graphic images. It is designed to easily get the screen hardcopies of almost all the commercially available Graphics Adapters for IBM-PC Compatibles or Macintosh series computers (for example CGA, EGA, Hercules, VGA, etc). Subsequent sections will give you the specific information on graphics commands. The easiest way to take advantage of this printer's capabilities is by using one of the many graphics programs available. When buying graphics software, always make sure it has the option to allow printouts on this printer. Any program that has an option for this printer, Epson LQ-850 or IBM ProPrinter X24E, should give excellent results, by using different dot densities to produce

realistic gray scales. Most graphics programs have a printer selection procedure. Please check the list on the previous page to find the proper selection.

- ## Programming Language

Most users rely on application programs to send commands to the printer. An awareness of programming languages, however, can be helpful in exploring a printer's potential or troubleshooting a printing problem. For example, if you want to set up your application program to send a command for italic printing, you can use a programming language, such as BASIC, PASCAL or C, to do a quick printout before setting up the program. On the other hand, if a program to send a certain command to the printer does not work correctly, you can send the same command to the printer using a programming language to find whether the problem lies with your application program, the command, or the printer.

- ## Sending Printer Commands in BASIC

You can send printer commands with any programming language. The examples in this manual are written in BASIC, because BASIC is included with most computer systems. In most forms of BASIC, and in particular Microsoft BASIC, the normal method of producing printed output is to use the LPRINT statement followed by the text to be printed enclosed in quotation marks, as shown below:

```
100 LPRINT "This text will be printed."
```

Individual printer control commands can be sent by using the CHR$ function with the LPRINT statement:

```
110 LPRINT CHR$(27);CHR$(69);
```

This line sends ASCII codes 27 and 69 to the printer, selecting emphasized printing.

Most versions of BASIC permit the ASCII codes in the CHR$ function to be given in either decimal or hexadecimal. Also, where the code corresponds to a printable character, the character itself can be quoted in the LPRINT statement. The command shown above could therefore be given in two other forms:

```
LPRINT CHR$(27);"E"
LPRINT CHR$(&H1B);CHR$(&H45)
```

As you can see, Microsoft BASIC uses &H to denote hexadecimal numbers. If you have another version of BASIC or different programming language, consult the manual for the language to find the correct formats for these commands.

4.4 Printer Control Through Control Codes

To fully exploit the features of the printer, the printer itself is programmed to understand some control codes and act accordingly. With these control codes, we can do some useful things, like graphic image printing, enhancements to wordprocessing, etc.

Control codes are classified into two groups.

One-byte control codes
CR, SO, LF, etc.

Control codes extended by ESC
ESC 0, ESC A + n, etc.

Refer to Appendix C for the summary of control codes.

Chapter 5
INTERFACE

5.1 The parallel Interface (default)

5.1.1 Parallel Interface Specifications

Data transmission	:	8-bit parallel
Synchronization	:	Externally supplied $\overline{\text{STROBE}}$ pulse
Handshaking	:	$\overline{\text{ACK}}$ and BUST signal
Logic Level	:	TTL level compatible
Adaptable Connector	:	MRD-36SB (36 Pin Burndy) or equivalent

Pin	Return	Signal	Dir.	Description
1	19	$\overline{\text{STROBE}}$	IN	Storbe pulse to read the input data. Pulse width must be more than 0.5μs at receiving terminal. The signal level is normally "HIGH". Input Data is latched after falling edge of this signal.
2	20	DATA0	IN	These signals represent information of the 1st to 8th bits of parallel data respectively. Each signal is at "HIGH" level when data is logical 1 and "LOW" when logical 0.
3	21	DATA1	IN	
4	22	DATA2	IN	
5	23	DATA3	IN	
6	24	DATA4	IN	
7	25	DATA5	IN	
8	26	DATA6	IN	
9	27	DATA7	IN	
10	28	$\overline{\text{ACK}}$	OUT	"Low" signal indicates that data has been received and that the printer is ready to accept next data. Pulse width is approximately 12μs.
11	29	BUSY	OUT	A "HIGH" signal indicates that the printer cannot receive data. A "LOW" signal indicates that the printer can receive data. The signal becomes "HIGH" in the following cases: 1. During data entry 2. During printing operation and part of head carrier operation 3. During part of paper feed 4. During printer error status 5. In OFF-LINE state

Pin	Return	Signal	Dir	Description
12	30	PE	OUT	A "HIGH" signal indicates that the printer is out of paper. This signal is effective only when $\overline{\text{ERROR}}$ signal is "LOW".
13		SEL	OUT	A "HIGH" indicates that the printer is ready.
14		GND		LOGIC GND level
15		NC		Not used
16		GND		LOGIC GND level
17		NC		Not used
18		VCC		Always "HIGH" (Pulled up to +5V through a 1K-ohm resistor)
19 -30		GND		Ground for twisted-pair grounding
31	16	$\overline{\text{PRIME}}$ ($\overline{\text{INIT}}$)	IN	When the level of this signal becomes "LOW", the print buffer memory is cleared. The pulse width must be more than 50μs at the receiving terminal.
32		$\overline{\text{ERROR}}$	OUT	The level of this signal becomes "LOW". When the printer is in the error status: 1. PAPER END state 2. Home Position Detection Error 3. OFF-LINE state
33 -36		NC		Not used

NOTE

1. *Signal direction is viewed from the printer.*
2. *All interface conditions are based on TTL level. Both the rise and fall times of each signal must be less then 0.2μs.*
3. *Data transfer must not be carried out by ignored the $\overline{ACK}$ or BUSY signal. When data transfer is made in an $\overline{ERROR}$ state, printing and processing of data are not guaranteed.*
4. *All barred signals are active low.*

5.2 The Serial Interface(optional)

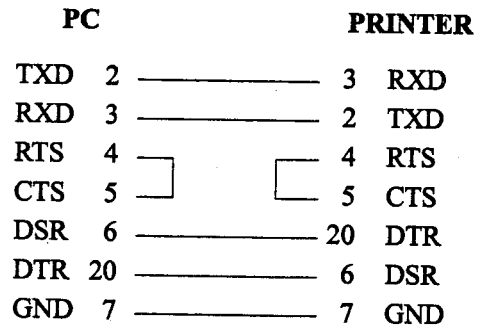
5.2.1 Serial Interface Specifications

- Synchronization : Asynchronous
- Baud rate : 150 - 9600 bps
- Word length
  - Start bit : 1 bit
  - Data format : 8 or 7 bit
  - Stop rate : over 1 bit length
  - Parity bits : odd, even or non-parity
- RS-232C Logic level
  - mark : logical "1" (-5V - -15V)
  - space : logical "0" (+5V - +15V)
- Handshaking for Flow Control
  - DTR : space = data entry possible
    mark = data entry not possible
  - XON/XOFF : XON <11H> = data entry possible
    XOFF <13H> = data entry not possible
- Connector : EIA-rated 25 pin connector type

Pin	Signal	Description
1	CG	Printer chassis ground
2	TXD	Serial output data
3	RXD	Serial input data
4	RTS	Internally tied to CTS
5	CTS	Internally tied to RTS
6	DSR	This signal must be in space status if computer wants to send data to printer.
7	SG	Signal ground
20	DTR	This signal indicates that printer is busy when it is in mark status.

* Signal direction is viewed from the printer.

5.2.2 Suggested Cable Connection Diagram



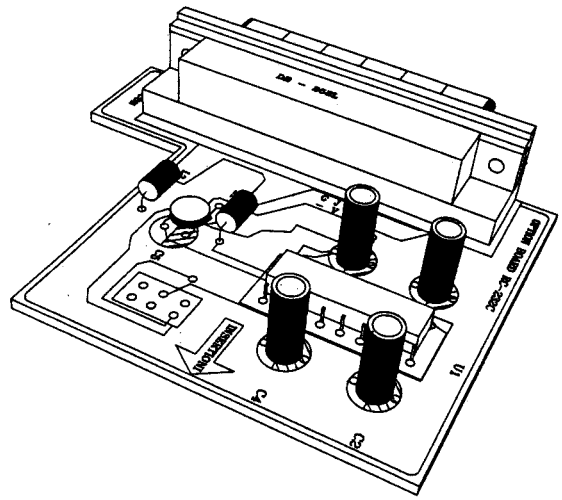


Fig. 5-1 Serial Interface Board

5.2.3 Selecting the Operating Conditions

Refer to the Appendix A. Initial Settings in order to change the serial operating parameters.

Chapter 6

MAINTENANCE

This printer does not need routine maintenance, but preventive maintenance will extend its life and enhance its performance. We recommend the following preventive and periodic measures:

6.1 Preventive Maintenance

Keep all liquids and dirt away from the printer.

Do not place books, paper or other heavy objects no top of the printer.

Always choose a safe location for the printer. Take special care to protect the printer if it is used in a poor environment such as a dusty or sandy place.

To extend the life of the printhead in the printer, please follow these simple instructions:

- *Do not operate the printer without the paper and ribbon cartridge.*
- *Do not fire the same pins continuously (in case of underline, or graphic, etc) without providing enough Time to cool the printhead.*
- *Do not touch the printhead manually while in operation.*
- *Unplug the power cord if you are not going to use the printer for a long time.*

6.2 Cleaning

An occasional cleaning of the printer is good. Frequency of cleaning may vary according to your operating environment.

- Cabinet Exterior
  Clean the printer cabinet and cover with a soft cloth moistened with a mild detergent. Do not use a tough cloth or solvent, alcohol or paint thinner, because the printer cabinet or cover may be discolored or scratched and the printed characters may be erased. Great care should be taken not to get electrical and mechanical components wet.

- Cabinet Interior
  Use a soft brush to remove dust from the printer mechanism and electronic components. Be careful not to damage any electronic components.

- Nose of Print Head
  First, remove the ribbon cartridge from the printer. Then, pull the copy control lever toward "-" direction to increase the gap between the platen and head nose. Use a soft brush to remove the dust or dirt. Be careful not to damage the ribbon guide plate. After you have finished, return the control lever to its previous position.

6.3 Replacement of the parts

- Ink Ribbon
  The inked ribbon in the cartridge permits the printing of about 1000 pages of single spaced characters. You should replace the ribbon cartridge when the printed characters begin to fade. Replacement is very simple. Just remove the old cartridge and replace it with a new one. Notice the ribbon installation procedure in chapter 2 for details.

- Print Head
  The print head is capable of printing of about 200 million characters. When the printed characters begin to fade out, even with a new ribbon cartridge, you may know it's time to replace the print head.
  Please contact your dealer to replace the print head.
  Do not attempt major replacements by yourself.

6.4 Trouble Shooting

The followings present solutions for possible problems. Please read it carefully when you have some problems with this printer. If you are not able to locate the problem, contact your dealer.

- PROBLEM
  Power indicator does not turn on.

- SOLUTION
  Make sure that the printer is plugged into a working outlet and the power switch is on.

- PROBLEM
  ON LINE indicator does not turn on.

- SOLUTION
  Push the ON LINE button; you may have accidentally pushed the ON LINE button to enter OFF line mode.Make sure that the paper is properly installed.

- PROBLEM
  Printer does not print.

- SOLUTION
  Make sure that the printer and computer are connected. Be certain you are using the correct cable.

  If the program you are using allows you to choose between screen output and printer output, check that you have selected printer output.

  If the printer still does not print, try the self test procedure (See Chapter 3).

  If the self test works properly, then the problems exists elsewhere.

  If the self test does not work properly, contact your dealer.

- PROBLEM
  Printing is faint, uneven, or intermittent.

- SOLUTION
  Make sure that the ribbon is installed properly. Make sure that ribbon moves freely in the cartridge. Make sure that the gap between print head and paper is properly set. This gap may be adjusted by copy paper lever (See chapter 2 for details). If the gap is too wide to print, the printing will appear faint.

  If you have used the ribbon for a long time or for a large amount of printing, you may need to replace it. The print head can wear out if the printer is used frequently and for long periods of time. Contact your dealer for a replacement print head. Never attempt to replace it by yourself.

Appendix A

INITIAL SETTINGS

The Non-Volatile RAM is a read/write memory where we can store the user preferred operating modes permanently. By changing the contents of this memory, we can have the printer be ready in certain operating modes everytime we turn on the printer.

Go through the following procedure to change the initial settings.

1. Press the MENU key in the off line status.
2. Use the LINE FEED key to select the GROUP.
3. Use the FORM FEED key to select the ITEM.
4. Use the PARK/LOAD key to select the SELECT.
5. After you finished changing the printing modes, press the MENU key. It's ready to print.

Here are the list of the meanings of each GROUP, ITEM, SELECT.

GROUP	ITEM	SELECT
GROUP 1	Font	<Draft>, Roman, Sanserif, Courier, Gothic, Elite
	Pitch	<10>, 12, 15, 17, 20, PS
	P. Length	<11">, 11 2/3", 12", 14", 15", 8", 6"
	Cha. Set	Set 1, <Set 2>, Set 3 (Italics)
	Emulation	<EPSON>, IBM
	Grph.dir	<Uni>, Bi
	Zero Cha.	<Unslashed>, Slashed
	Code Page	<#437>, #850, #860, #861, #863, #865
	Country	<U.S.A.>, France, Germany, U.K., Denmark 1, Sweden, Italy, Spain 1, Japan, Norway, Denmark 2, Spain 2, Latin-America, Legal
	DOWN LD.	<Disable>, Enable
GROUP 2	ACSF	<Off>, On
	LPI	<6 Lpi>, 8 Lpi
	Autotear	<Off>, On
	Auto LF	<Off>, On

GROUP	ITEM	SELECT
	Auto CR	<Off>, On
	1" SKIP	<Off>, On
	LQ_Vtcl	-2.5, -2, -1.5, -1, -0.5, 0, +0.5, +1, +1.5, <+2>, +2.5
	DT_Vtcl	-2.5, -2, -1.5, -1, -0.5, 0, +0.5, +1, +1.5, <+2>, +2.5
GROUP 3	Interface	<Centronics>, RS-232C
	Protocol	<XON/XOFF>, DTR/DSR
	Parity	<None>, Odd, Even
	Data	<8 Bit>, 7Bit
	Baud Rate	<9600>, 4800, 2400, 1200, 600, 300, 150

* Current settings are <...>.

NOTE

You can enable the download feature only after you have installed the optional 32k bytes buffer.

When Epson italics character set is selected, the international character sets can be used to print the country specific characters.

Here are the characters for the corresponding NVRAM code.

ASCII Code Hex. ASCII Code Dec.	23 35	24 36	40 64	5B 91	5C 92	5D 93	5E 94	60 96	7B 123	7C 124	7D 125	7E 126
0 USA	#	$	@	[	\	]	^	`	{	|	}	~
1 France	#	$	à	°	ç	§	^	`	é	ù	è	¨
2 Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3 ENGLAND	£	$	@	[	\	]	^	`	{	|	}	~
4 DENMARK I	#	$	@	Æ	ø	Å	^	`	æ	ø	å	~
5 SWEDEN	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6 ITALY	#	$	@	°	\	é	^	ù	à	ò	è	ì
7 SPAIN I	Pt	$	@	¡	Ñ	¿	^	`	~	ñ	}	~
8 JAPAN	#	$	@	[	¥	]	^	`	{	|	}	~
9 NORWAY	#	¤	É	Æ	ø	Å	Ü	é	æ	ø	å	ü
10 DENMARK II	#	$	É	Æ	ø	Å	Ü	é	æ	ø	å	ü
11 SPAIN II	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
12 LATIN AMERICA	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú
64 LEGAL	#	$	§	°	´	"	¶	`	©	®	†	TM

Appendix B

CHARACTER SETS

Character Set 1

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p								
1		DC1	!	1	A	Q	a	q		DC1						
2		DC2	"	2	B	R	b	r		DC2						
3		DC3	#	3	C	S	c	s		DC3						
4		DC4	$	4	D	T	d	t		DC4						
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7	BEL		'	7	G	W	g	w	BEL							
8	BS	CAN	(	8	H	X	h	x	BS	CAN						
9	HT		)	9	I	Y	i	y	HT							
A	LF		*	:	J	Z	j	z	LF							
B	VT	ESC	+	;	K	[	k	{	VT	ESC						
C	FF		,	<	L	\	l	|	FF						
D	CR		-	=	M	]	m	}	CR							
E	SO		.	>	N	^	n	~	SO							
F	SI		/	?	O	_	o		SI							

Character Set 2

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É						
1		DC1	!	1	A	Q	a	q	ü							
2		DC2	"	2	B	R	b	r	é	Æ						
3	♥	DC3	#	3	C	S	c	s	â	ô						
4	♦	DC4	$	4	D	T	d	t	ä	ö						
5	♣	§	%	5	E	U	e	u	à	ò						
6	♠		&	6	F	V	f	v	å	û						
7			'	7	G	W	g	w	ç	ù						
8	BS	CAN	(	8	H	X	h	x	ê	ÿ						
9	HT		)	9	I	Y	i	y	ë	Ö						
A	LF		*	:	J	Z	j	z	è	Ü						
B	VT	ESC	+	;	K	[	k	{	ï	¢						
C	FF		,	<	L	\	l	|	î	£					
D	CR		-	=	M	]	m	}	ì	¥						
E	SO		.	>	N	^	n	~	Ä	Pt						
F	SI		/	?	O	_	o		Å	ƒ						

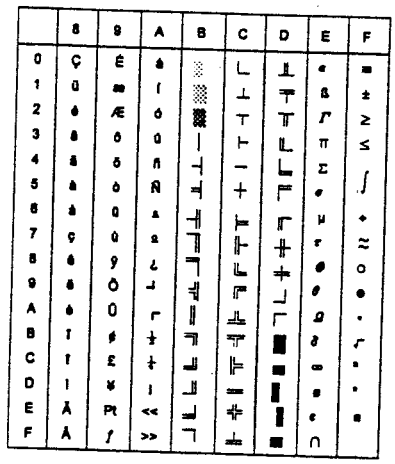
Character Set 3(ITALICS)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				0	@	P	`	p
1		DC1	!	1	A	Q	a	q		DC1	!	1	A	Q	a	q
2		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r
3		DC3	#	3	C	S	c	s		DC3	#	3	C	S	c	s
4		DC4	$	4	D	T	d	t		DC4	$	4	D	T	d	t
5			%	5	E	U	e	u			%	5	E	U	e	u
6			&	6	F	V	f	v			&	6	F	V	f	v
7			'	7	G	W	g	w	BEL		'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
9	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
A	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{	VT	ESC	+	;	K	[	k	{
C	FF		,	<	L	\	l	¦	FF		,	<	L	\	l	/
D	CR		-	=	M	]	m	}	CR		-	=	M	]	m	]
E	SO		.	>	N	^	n	~	SO		.	>	N	^	n	~
F	SI		/	?	O	_	o	DEL	SI		/	?	O	_	o	DEL

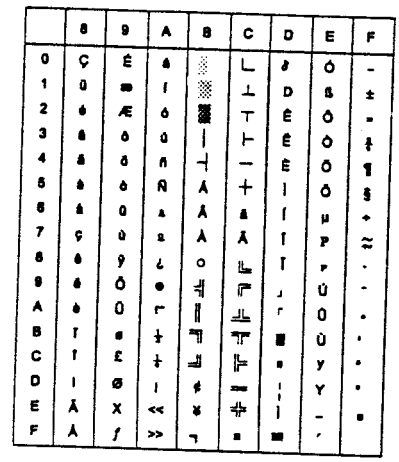
All Characters Set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	▯	▶	SP	0	@	P	`	p	Ç	É	á	▒	└	╨	α	■
1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	●	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◘	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	△	Å	ƒ	»	┐	╧	▀	∩	SP

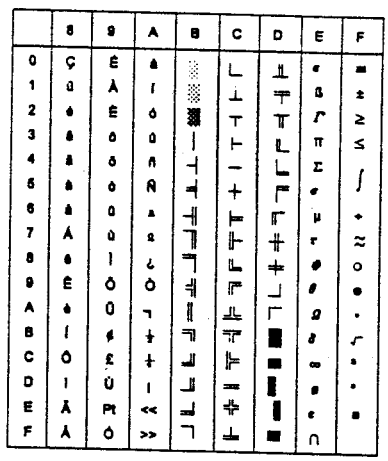
#437(U.S.A.)



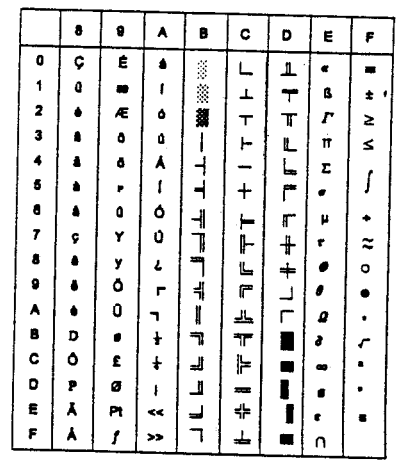
#850(Multi-Lingual)



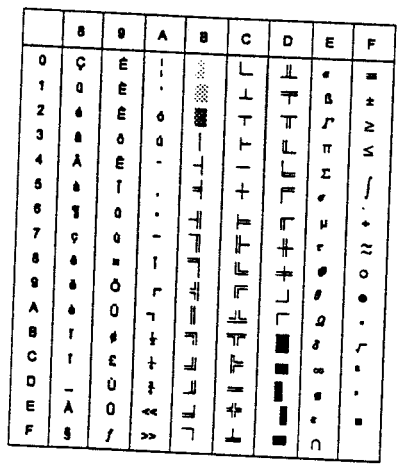
#860(Portugal)



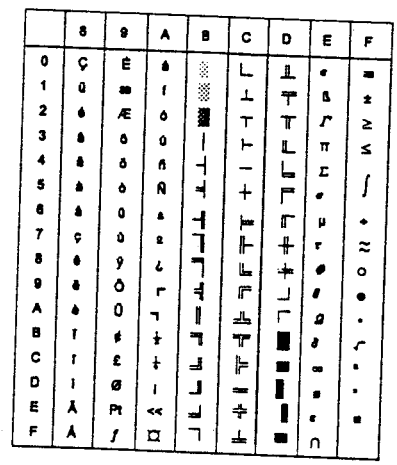
#861(Icelandic)



#863(Canada-French)



#865(Norway)



Appendix C

COMMAND SUMMARY

ONE BYTE CONTROL CODES

	Hex	Function	Epson	IBM
NUL	00H	Null		V
BS	08H	Backspace	V	V
HT	09H	Horizontal Tab	V	V
LF	0AH	Line Feed	V	V
VT	OBH	Vertical Tab	V	V
FF	0CH	Form Feed	V	V
CR	0DH	Carriage Return	V	V
SO	0EH	Select Double-Wide (one line)	V	V
SI	0FH	Select Condensed Mode	V	V
DC1	11H	Select Printer	V	V
DC2	12H	Cancel Condensed Mode	V	
		Select 10 CPI		V
DC3	13H	Deselect Printer	V	V
DC4	14H	Cancel Double-Wide Mode(one line)	V	V
CAN	18H	Cancel a Print Line	V	V
SP	20H	Space		V
DEL	7FH	Delete Character	V	

MULTI-BYTE CONTROL CODES

	Hex	Function	Epson	IBM
ESC SO	1B 0E	Select Double-Wide Mode(one line)	V	
ESC SI	1B 0F	Select Condensed Printing	V	
ESC EM	1B 19	Turn Sheet Feeder On/Off	V	
ESC SP	1B 20	Select Intercharacter Space	V	
ESC !	1B 21	Print Mode Selection	V	

	Hex	Function	Epson	IBM
ESC #	1B 23	Cancel MSB Control	V	
ESC $	1B 24	Set Absolute Dot Position	V	
ESC %	1B 25	ROM/Download CG on/off	V	
ESC &	1B 26	Download Character Definition	V	
ESC (-	1B 28 2D	Select/Cancel Score	V	
ESC *	1B 2A	Select Graphics Mode	V	
ESC +	1B 2B	Select n/360-inch Line Spacing	V	
ESC -	1B 2D	turn underlining on/off	V	V
ESC /	1B 2F	Select Vertical Tab Channe	V	
ESC 0	1B 30	Select 1/8 inch line spacing	V	V
ESC 1	1B 31	Select 7/72 inch line spacing		V
ESC 2	1B 32	Select 1/6 inch line spacing	V	
ESC 3	1B 33	Select programmable line spacing Set n/180 inch line spacing	V	V
ESC 4	1B 34	Set n/216 inch line spacing Select italic characters	V	V
ESC 5	1B 35	Set Top of Form Cancel italic characters	V	V
ESC 6	1B 36	Turn AUTO LF function on/off Printable Code Area Expansion	V	V
ESC 7	1B 37	Select IBM character set 2 Cancel ESC 6	V	V
ESC :	1B 3A	Select IBM character set 1 Copy ROM CG into RAM CG	V	V
ESC <	1B 3C	Select 12 CPI Printing Select Uni Mode (One Line)	V	V
ESC =	1B 3D	Clear MSB of Incoming Data	V	
ESC >	1B 3E	Set MSB of Incoming Data	V	
ESC ?	1B 3F	Reassign 8-pin Image Commands	V	
ESC @	1B 40	Initialize Printer	V	
ESC A	1B 41	Set n/60 inch Line Spacing	V	
ESC B	1B 42	Set Programmable Line Spacing Set Vertical Tab Position	V	V V
ESC C	1B 43	Set Form Length in Lines	V	V
ESC C 0	1B 43	Set Form Length in Inches	V	V
ESC D	1B 39	Set Horizontal Tabs	V	V

COMMAND SUMMARY

	Hex	Function	Epson	IBM
ESC E	1B 45	Select Emphasized Printing	V	V
ESC F	1B 46	Cancel Emphasized Printing	V	V
ESC G	1B 47	Select Double-Strike Printing	V	V
ESC H	1B 48	Cancel Double-Strike Printing	V	V
ESC I	1B 49	Select print mode		V
ESC J	1B 4A	Perform n/180-inch Line Feed	V	
		Execute n/216 Inch Line spacing		V
ESC K	1B 4B	Set Single Density Bit Graphics	V	V
ESC L	1B 4C	Set Double Density Bit Graphics	V	V
ESC M	1B 4D	Select 12 Pitch	V	
ESC N	1B 4E	Set Perforation Length	V	V
ESC O	1B 4F	Cancel Skip Perforation	V	V
ESC P	1B 50	Select 10 Pitch	V	
		Select Proportional Spacing		V
ESC Q	1B 51	Set Right Margin	V	
		Deselect Printer		V
ESC R	1B 52	Select International Character	V	
		Set Restore Default Tab Setting		V
ESC S	1B 53	Select Super/Subscript Mode	V	V
ESC T	1B 54	Cancel Super/Subscript Mode	V	V
ESC U	1B 55	Select Uni-Directional Printing	V	V
ESC W	1B 57	Select Enlarged Printing	V	V
ESC X	1B 58	Set Horizontal Margins		V
ESC Y	1B 59	Select High-speed Double-density	V	
		Set NS Double Density Graphics		V
ESC Z	1B 5A	Set Quadruple Density Graphics	V	
		Set High Density Graphics		V
ESC [@	1B 5B 40	Double-high Printing		V
ESC [K	1B 5B 4B	Set Initial Condition		V
ESC [\		Set Vertical Units		V
ESC [g		High-Resolution Graphics		V
ESC [T		Select IBM Code Page		V
ESC \	1B 5C	Set Relative Dot Position	V	
		Print Characters from Symbol Chart		V

	Hex	Function	Epson	IBM
ESC ^	1B 5E	Print One Character from Symbol Chart		V
ESC _	1B 5F	Turn the overscore on/off		V
ESC a	1B 61	Select justification	V	
ESC b	1B 62	Set vertical tabs in channel	V	
ESC d	1B 64	Relative Move Inline Forward		V
ESC g	1B 67	Select 15 Pitch	V	
ESC j	1B 6A	Stop Printing		V
ESC k	1B 6B	Select Typestyle Family	V	
ESC l	1B 6C	Set Left margin	V	
ESC p	1B 70	Turn Proportional Mode On/Off	V	
ESC q	1B 71	Select Character Style	V	
ESC t	1B 74	Select Character Table	V	
ESC w	1B 77	Turn double-high on/off	V	
ESC x	1B 78	Select NLQ/Draft Mode	V	